

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Loose Leaf Binders

We, A/S GAVEREKLAMB, a Company organised under the laws of Denmark, of 12 Gammel Mont, Copenhagen, K, Denmark, do hereby declare the invention for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to loose leaf binders.

More specifically the invention relates to loose leaf ring binders of the type having a cover structure and rings for holding sheets which are inserted in the binder, the rings being capable of being opened to insert sheets in the binder or remove sheets from the binder.

It is a purpose of the invention to provide a binder of the type here referred to in which a substantial part of the binder structure can be produced in one single operation.

According to the invention in a loose leaf binder:

a) a cover has a back and sides formed in one-piece from a strong and highly deformable synthetic resin, the sides being hinged to the back by weakening lines in the synthetic resin;

b) the back has two portions on each of which one complementary member of a pair of complementary sheet holding members is mounted;

c) the two portions can be hinged or flexed relatively to one another to cause the two sheet holding members either to be moved together to hold the sheets of paper in the binder, or to be separated, to allow the insertion into or extraction from the binder of sheets of paper; and

d) means are included in or associated with the two portions to hold them in the mutual

positions in which the two members are clamped together and are manually operable to separate the complementary members, the means being formed from the same material as the cover. 45

How the invention may be carried out will now be described with reference to the accompanying drawings in which:

In the drawing 50

fig. 1 is a perspective view of a part of a loose leaf binder according to the invention,

fig. 2 is a cross section through the back and a part of the side covers of the binder, illustrated in fig. 1, showing the sheet holding rings in two positions, 55

fig. 3 is a perspective view similar to that of fig. 1, showing a modified embodiment,

fig. 4 is a perspective view of a further embodiment, 60

fig. 5 is a perspective view of a modified form of a cover lock,

fig. 6 is a perspective view of a further modified embodiment with the rings closed, 65

fig. 7 is the arrangement of fig. 6 with the rings opened,

fig. 8 is a still further modified embodiment with the rings closed and

fig. 9 is the arrangement of fig. 8 with the rings opened. 70

The loose leaf binder of the present invention has a cover moulded in one-piece from a synthetic resin.

As the best suitable material is available to day polypropylene shall be mentioned, because it enables highly flexible bending lines to be made between two sheet parts which will be able to stand a nearly unlimited number of foldings and unfoldings. Other plastic material with similar physical properties may be used within the scope of the invention. 75 80

In the embodiments of fig. 1 and 2 the

[Price]

cover 10 of the binder is made from a sheet of polypropylene which is moulded with hinge lines of high flexibility to pivotally connect portions 24a and 24b which form the sides of the cover with a portion 14 of the sheet which forms the back of the cover.

Sheets of paper are held by complementary members in the form of a plurality of pairs of half-rings 20a, 20b and 22a, 22b which in fig. 1 and 2 are secured to two portions in the form of strips 16a and 16b which are integral with the cover and form a part of the cover itself. The strips 16a and 16b extend in the longitudinal direction of the back 14 and can bent or hinge relatively to the back about bending lines of high flexibility

The half-rings are preferably moulded in one piece with the strips 16a and 16b to provide a unitary structure, though they may be formed separately, as in the embodiment of figure 3.

In the embodiment of fig. 1 and 2 the strips 16a and 16b extend along the edges of the back 14 and separate the sides 24a and 24b from the back. In production the bending lines between the back 14 and the strips 16a, 16b as well as the bending lines between the strips and the cover sides 24a and 24b are provided in the form of elongated depressions such as obtained by means of elongated strips in the die in which the cover is made, for example by injection moulding in such a manner that only narrow bridges 15a and 15b are provided between the back 14 and the edges of the strips 16a and 16b and similar narrow bridges 17a and 17b are provided between the edges of the strips and the cover sides 24a and 24b. The narrow bridges or bending lines must be so dimensioned as to be flexible enough and at the same time strong enough to provide hinges between the parts of the sheet to form durable hinge connections under the required conditions.

The complementary half-rings are together, to hold the sheets of paper, when the strips 16a and 16b are swung to the position substantially perpendicular to the plane of the cover back 14 while half-rings are separated when one or both of the strips is swung, as indicated in dotted lines in fig. 2, to form an obtuse angle with the plane of the back cover 14.

In order to lock the half-rings together, suitable lock means are provided which are preferably moulded in one-piece with the cover and make use of the resilience of the plastics material from which the cover is moulded.

In fig. 1 such lock means is shown at one end of the structure, but it could be at both ends.

The lock means of Fig. 1 is in the form of a transverse member 12 which is integral with the back 14 of the cover and which

extends between the ends of the strips 16a and 16b and has hook-like extensions 18a, 18b, capable of snapping over extensions 10a, 19b at the ends of the strips 16a and 16b. As shown in fig. 1 the exterior surfaces of the hooks 18a, 18b are curved or wedge-shaped and the interior surfaces of the extensions 19a, 19b are similarly curved or wedge-shaped. Thus when the half-rings are closed by swinging the strips 16a, 16b from the position shown in fig. 2 in dotted lines to the position shown in full lines the curved or wedge-shaped inner surfaces of the extensions 19a, 19b will engage the curved or wedge-shaped outer surfaces of the hooks 18a and 18b and due to the resilience of the material the transverse member 12 will thereby be bent slightly as indicated in dotted lines in fig. 1 so as to enable the hooks to snap outside the extensions 19a and 19b and thereby lock the half-rings in their closed position. In order to increase the resiliency of the hooked ends notches 12a and 12b are formed, as indicated in fig. 1.

Easy release of the half-rings is effected simply by bending the transverse member 12 slightly against the resiliency of the material so as to disengage one or both hooks from the corresponding extension of the strips, whereby one or both of the strips can be swung to the dotted-line-position, as shown in fig. 2.

The cover and lock means can thus be injection moulded in one-piece. The half-rings may also be moulded in one-piece with the rest of the cover.

The binder may be moulded with or to take different numbers of pairs of half-rings to conform with different standards used in different countries.

In mass production it is in such event only necessary to design tools with interchangeable parts for the half-rings in order to meet the requirements of the different standards.

In fig. 3 the strips are denoted by 116a, 116b and are formed with pairs of holes, channels or grooves 125a, 125b, 126a, 126b etc., adapted to receive and firmly hold the ends of separate half-rings 120a, 120b, 122a, 122b etc. The holes, channels or grooves in the strips may be cylindrical with the lower end of slightly increased cross sections, so as to hold the associated half-ring, which has a head at its lower end, when the half-ring is forced down through the hole, which is possible due to the resiliency of the material. It is also possible to design the holes, channels or grooves, as well as the lower ends of the half-rings with dovetailed cross section or any other suitable configuration.

The embodiment of fig. 3, the cover, including the lock means 118, can be manufactured as a unitary structure and as a standard item and with the necessary number of

channels, holes or grooves to take any standard spacing of half-rings.

The loose leaf binder may thus be supplied together with a number of loose half rings to be mounted in the desired positions.

The die for producing the unitary structure by injection-moulding will depend on the embodiment. The tool has to be designed to provide the narrow bridges 15a, 15b and 17a, 17b of the cover. In addition the desirability of moulding the locking portion 18 in one piece with the cover necessitates moulding the cover in an opened up condition, of the use of loose inserts in the die is to be avoided. Obviously the more the binder is opened up, the easier is the access to the half-rings. It is therefore recommended to design the die for producing the binder with the binder opened up at least to the position shown in dotted lines in fig. 2, but preferably with the binder folded back to a position with the strips 16a, 16b at least in alignment with the back and the remaining part of the binder folder further back. In this position there is practically free access to the half-rings and to the lock means from the top side which enables a convenient construction of the dies.

In the embodiment of fig. 3 the cross section of the holes, channels or grooves and the corresponding cross sections of the lower ends of the half-rings may be of any suitable configuration which will prevent the half-rings from turning in the holes, channels or grooves, once they have been mounted.

The binder according to the invention also lends itself to the construction of a suitcase-like letter file made as a completely unitary structure as shown in fig. 4. In this embodiment the construction of the binder is basically that of the embodiments of Figures 1 and 2 or 3 but the sides of the cover are shaped so that when the binder is closed the sides form a case. The cover sides 224a and 224b have side flanges 225a and 225b unitary therewith. The part of the flanges opposite the back 218 may have edges of suitable profiles such as a tongue on one edge and a groove on the opposite edge, adapted to be brought into engagement when the file is closed. On each of the sides a portion of a handle 230a, 230b is provided also moulded in one piece with the structure. The handles may be provided with press studs 232 for being locked together. In the top of the structure grooves 235 may be provided into which the handle portions can be recessed so as not to form any obstruction when the file is put away on a shelf.

In the embodiment of fig. 5 a modification of the lock means is shown. In this embodiment a transverse lock member 318 is spaced from the end of the back of the cover and has latching members adapted to engage slots or apertures 340a and 340 in the side strips of the cover.

While in the foregoing embodiments the

strips on which the half-rings are supported or adapted to be supported are provided between the sides of the back of the cover the embodiment of fig. 6 and 7 differs from the embodiment previously described in that the integral structure which comprises the sides 24a and 24b which by means of bending lines 13a and 13b are connected with the back has a bending line 11a substantially in the middle of the back so as to divide the back in two portions 14a and 14b on each of which a rib 16a and 16b respectively is provided integral with the corresponding part of the back.

The half-rings, 20a, 20b and 22a, 22b, are mounted on the ribs 16a and 16b so as to assume their closed position, (Figure 6), or their open position, (Figure 7), when the two parts of the back 14a and 14b are swung about the middle bending line 11a.

In order to lock the two ribs 16a and 16b together they are provided with locking projections 19a, 19b and 21a, 21b, respectively, with suitably designed cam surfaces which can be brought into or out of locking engagement with each other, due to the resiliency of the material.

The half-rings may also be integral with the cover or, if desired, the ribs 16a and 16b may be provided with a plurality of holes or apertures adapted to receive and hold correspondingly formed ends of the half-rings, as in the embodiment of figure 3.

The embodiment of fig. 8 and 9 differs from the embodiment of figs. 6 and 7 in that the back 54, which relatively is rigid and is connected with the sides 24a and 24b, by means of the bending lines 13a and 13b, is provided with a single resilient strip 56 which extends along a part of the length of the back and at its ends is separated from the remaining part of the back slots 58a and 58b. The strip 56 is narrower than the back 54 to leave zones 60 of the back on each side of the strip 56. The strip 56 is of arcuate shape in cross section and is connected with the zones 60 by bending lines of which one is shown at 62.

Due to the resilience of the material and the arcuate cross section of the strip 56 the strip can be flexed between one position as shown in fig. 8 in which it faces the interior of the loose leaf binder with a concave surface to a condition as shown in fig. 9 in which it faces the interior of the binder with a convex surface. This means that the two portions 56a and 56b of the strip 56 can be flexed relatively to each other about a geometrical axis which is represented by the line of symmetry.

By mounting the half-rings on each of the portions 56a and 56b respectively, or moulding the half-rings in one with these portions, the half-rings can be opened and closed by

flexing the strip 56 between its two stable positions shown in figures 8 and 9.

It would be understood that the invention is not limited to the embodiments here shown and described and further modifications will be possible within the scope of the invention as defined by the claims.

WHAT WE CLAIM IS:—

1. A loose leaf binder in which:
 - a) a cover has a back and sides formed in one-piece from a strong and highly deformable synthetic resin, the sides being hinged to the back by weakening lines in the synthetic resin;
 - b) the back has two portions on each of which one complementary sheet holding member of a pair of complementary members is mounted;
 - c) the two portions can be hinged or flexed relatively to one another to cause the two sheet holding members either to be moved together, to hold the sheets of paper in the binder, or to be separated, to allow the insertion into or extraction from the binder of sheets of paper; and
 - d) means are included in or associated with the two portions to hold them in the mutual position in which the two members are clamped together and are manually operable to separate the complementary members, the means being formed from the same material as the cover.
2. A loose leaf binder as claimed in claim 1 in which the synthetic resin is polypropylene.
3. A loose leaf binder as claimed in either claim 1 or 2 in which the two portions comprise two strips which extend parallel to and are hinged to the sides of the cover.
4. A loose leaf binder as claimed in claim 3 in which the two strips form the whole of the back of the cover.
5. A loose leaf binder as claimed in claim 3 in which the two strips are interconnected by and hinged to a third strip which together with the said two strips forms the back of the cover.
6. A loose leaf binder as claimed in either claim 1 or 2 in which the two portions form parts of a single strip of arcuate cross-section which is resilient and can be flexed between two stable positions to close or open the two complementary members of a pair which members are mounted on said single strip.
7. A loose leaf binder as claimed in claim 1 in which the said means comprises a deformable locking member formed in one-piece with and hinged to the cover and adapted to

be hinged into a first position to engage the two portions to hold them in the said mutual position, or manually movable into a second position to be disengaged from the two portions to allow the two members to be separated.

8. A loose leaf binder as claimed in claim 4 in which each portion has a rib formed in one-piece with it, the two ribs being adapted to engage one another when the two members are together to hold the two members together and being released from one another to allow the two members to be separated.

9. A loose leaf binder as claimed in claim 6 in which the said means comprises the said single strip which can be flexed into one stable position in which it holds the two members together.

10. A loose leaf binder as claimed in any previous claim in which the members are formed in one-piece with the cover.

11. A loose leaf binder as claimed in any of claims 1 to 10 in which the members are separate from the cover and can be inserted into or withdrawn from holes, channels or grooves formed in the cover.

12. A loose leaf binder as claimed in any previous claim in which each member comprises a half-ring.

13. A loose leaf binder as claimed in any previous claim in which the sides of the cover are shaped so that when the binder is closed the sides form a case.

14. A loose leaf binder substantially as hereinbefore described with reference to and as shown in Figures 1 and 2 of the accompanying drawings.

15. A loose leaf binder structure substantially as shown and described with reference to Figure 3 of the accompanying drawings.

16. A loose leaf binder as claimed in claim 1 and substantially as shown and described with reference to Figure 40 of the accompanying drawings.

17. A loose leaf binder as claimed in claim 1 and having the locking means substantially as described with reference to and as shown in Figure 5 of the accompanying drawings.

18. A loose leaf binder structure substantially as shown and described with reference to Figures 6 and 7 of the accompanying drawings.

19. A loose leaf binder structure substantially as shown and described with reference to Figures 8 and 9 of the accompanying drawings.

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Chartered Patent Agents,
317, High Holborn,
London, W.C.1.

5 SHEETS This drawing is a reproduction of
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Sheet 1

Fig. 1.

Fig. 2.

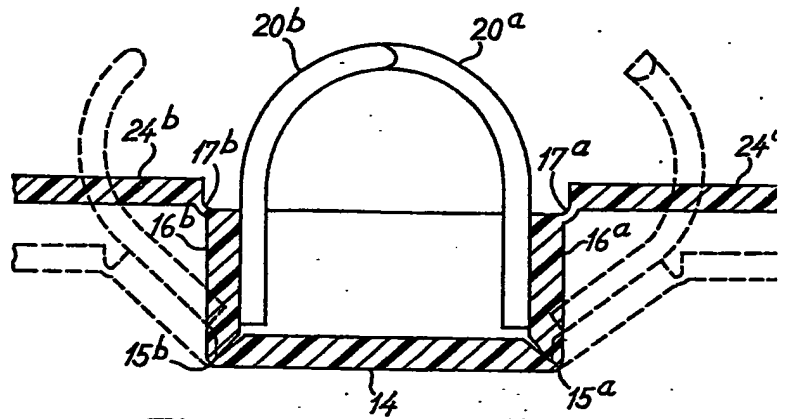
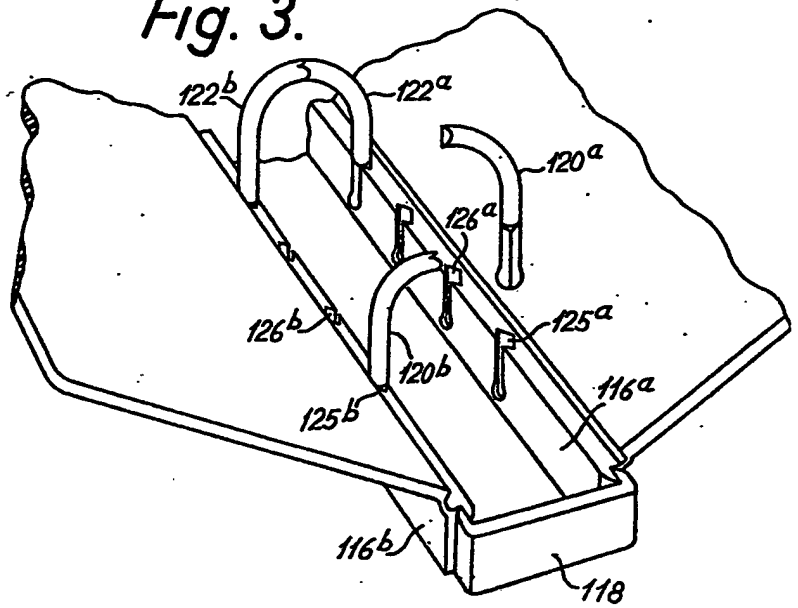


Fig. 3.



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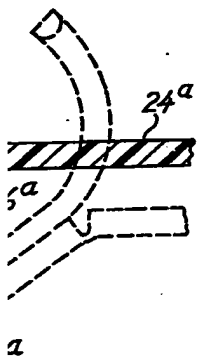
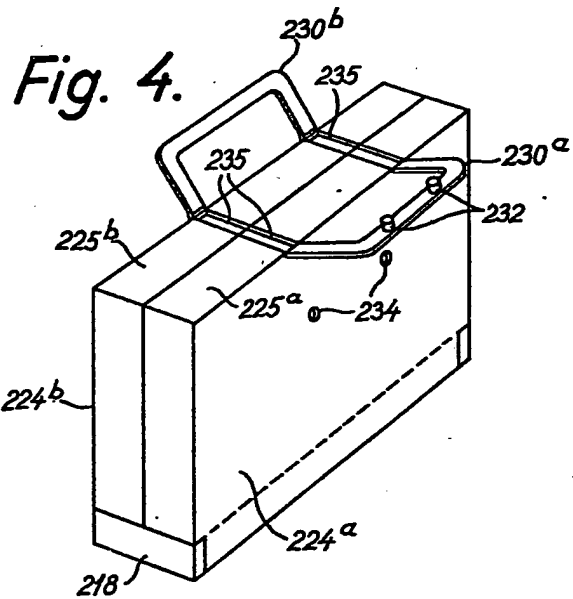


Fig. 5.

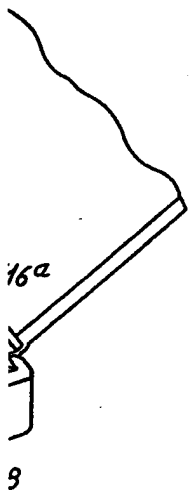
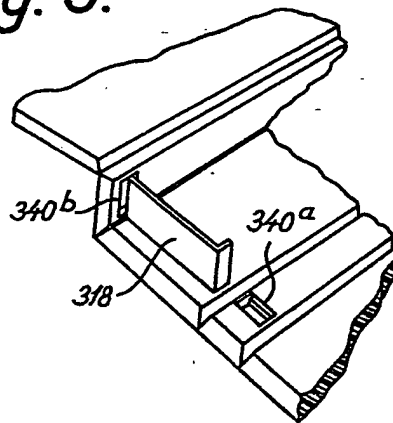


Fig. 2.

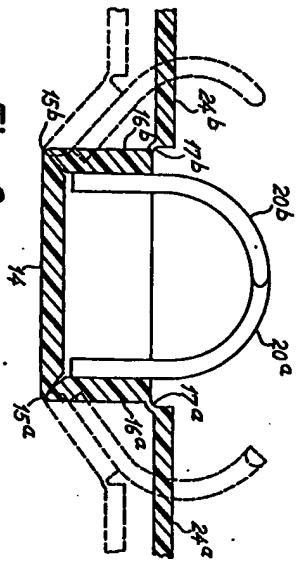


Fig. 3.

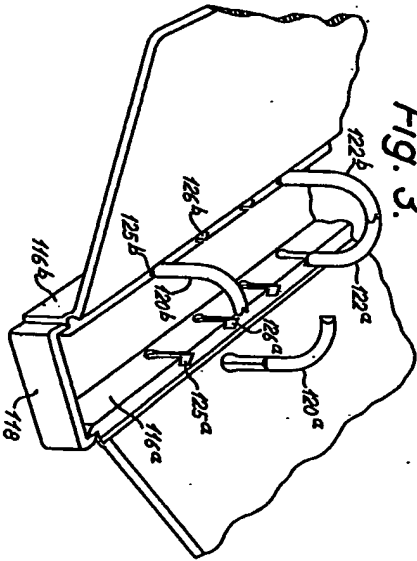


Fig. 4.

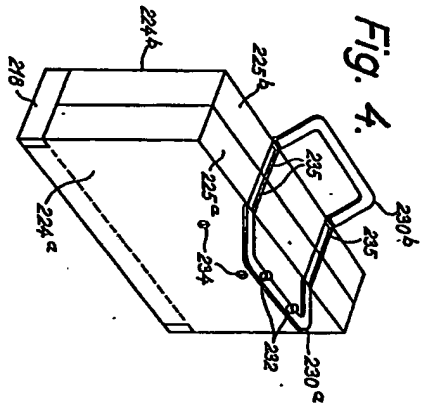


Fig. 5.

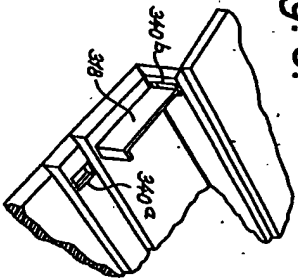


Fig. 6.

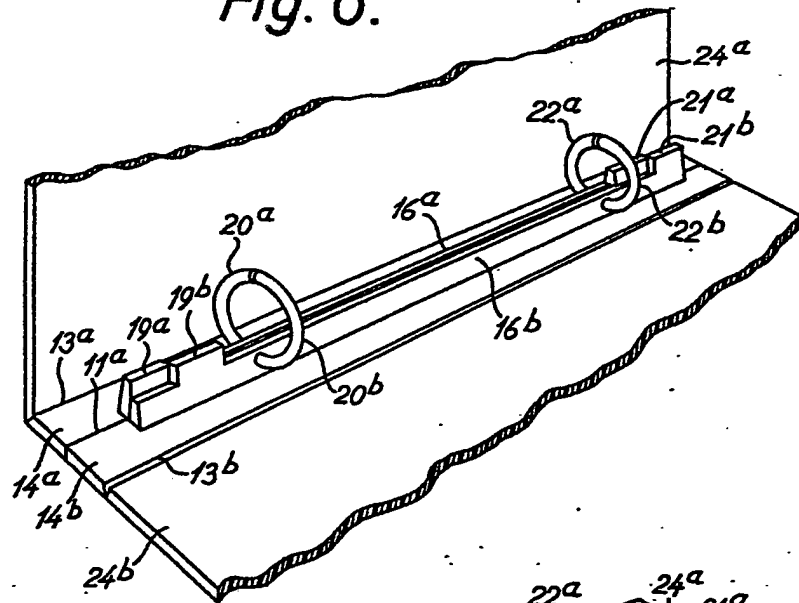
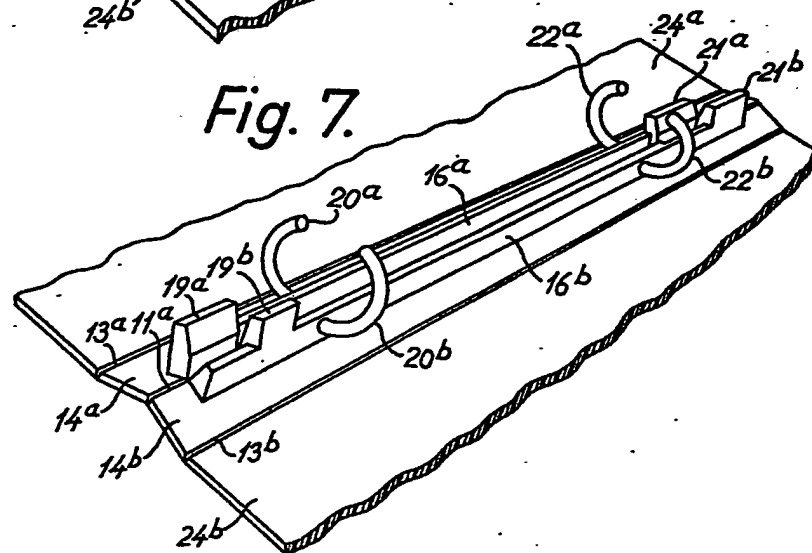


Fig. 7.



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Fig. 8.

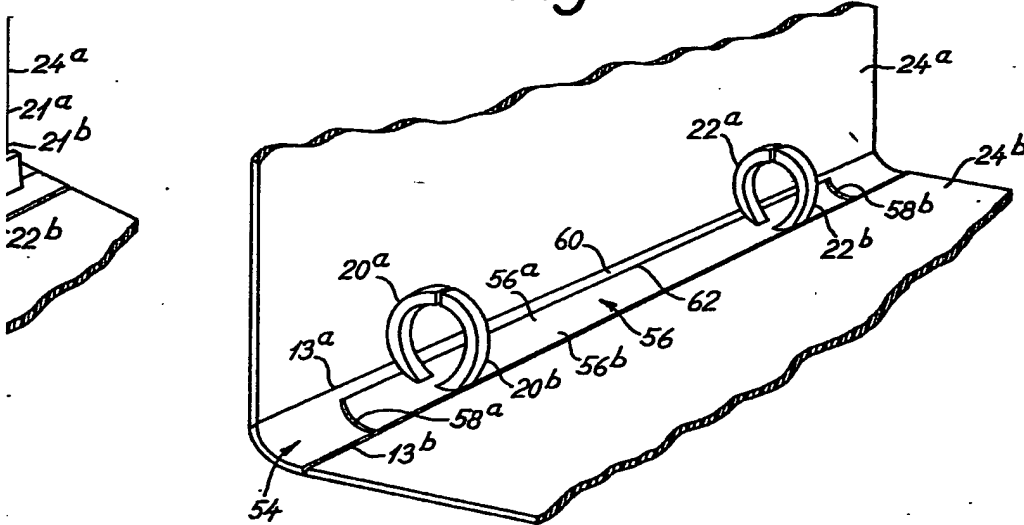


Fig. 9.

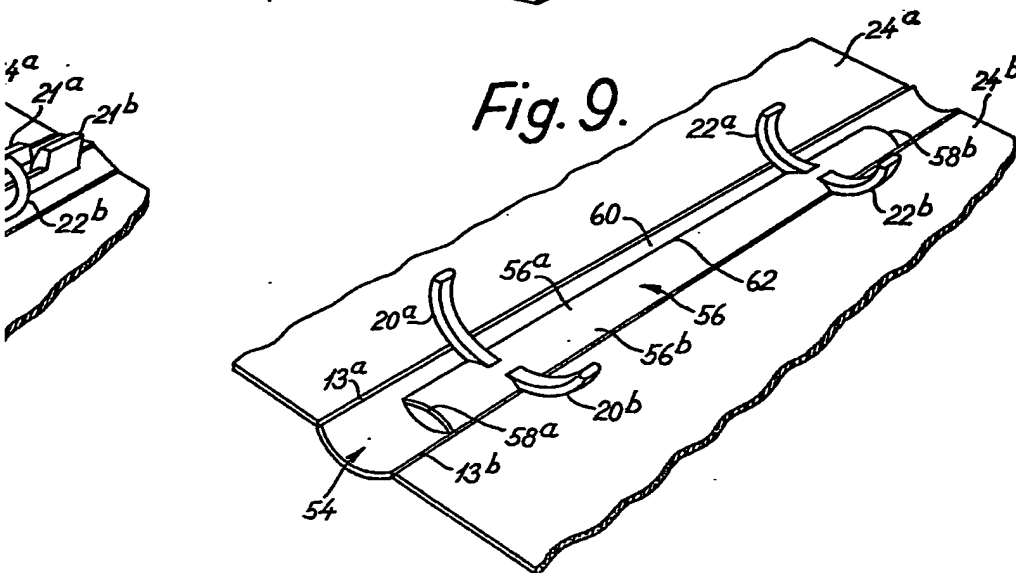


Fig. 6.

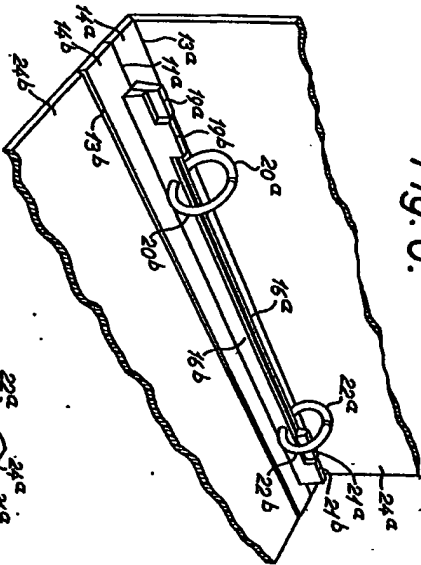


Fig. 8.

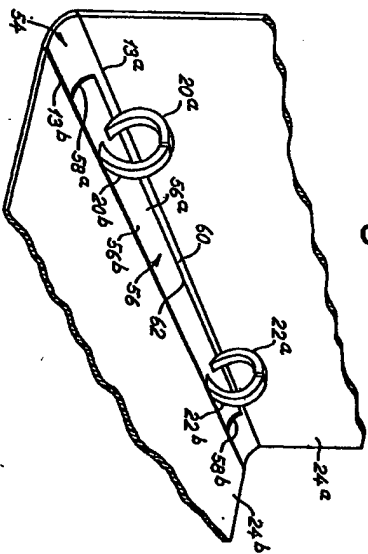


Fig. 7.

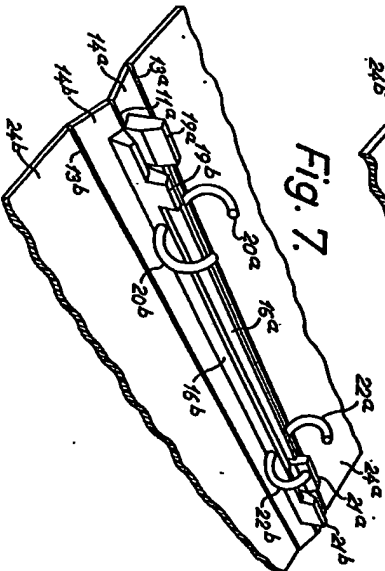


Fig. 9.

